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ABSTRACT

The prevalence of the Internet and the World Wide Web in higher education has been transforming higher educational institutions in various degrees. There are a wide variety of terms indicating such phenomenon, ranging from "web-based instruction" and "online courses" to "cyber degrees" and "virtual universities." These terms are often used without clear definition. This paper presents a taxonomy of higher education institutions in cyberspace that includes the following six categories: online course catalogs/clearing house, university brokerages, virtual university consortia, virtual universities, online campuses, and unaccredited online campuses. Three elements of online courses (course material presentation/distribution, communication, and assessment) are discussed in order to give a framework to designing online courses. Competency-based assessment and the future trend of educational institutions are also addressed. (Author/DLS)

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A Typology for Distance Education - Tool for Strategic Planning

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Abstract: The prevalence of the Internet and the Web in higher education has been transforming higher educational institutions in various degrees. There are a wide variety of terms indicating such phenomenon ranging from web-based instruction and online courses to cyber degrees and virtual universities. Those terms are often used without clear definition. In this paper, six different categories of higher educational institutions in cyberspace: online course catalog/clearing house, university brokerage, virtual university consortium, virtual university, online campus, and unaccredited online campus, are discussed to provide a big picture of current trends in distance education. Then, three elements of online courses are discussed in order to give some framework in designing online courses. Lastly, the future trend of higher educational institutions is also discussed.

1. Introduction

As the Internet and Web technologies are becoming the popular vehicle of instructional delivery, we have begun to see the plethora of words referring to such mode of instructional delivery (e.g., web-based instruction/course/distance education, Internet courses/university, online instruction/course/campus /university, cyber class/course/school/university, virtual classroom/campus/university, etc.). Though these terms share some common concepts; some instructional components delivered through computer networks and some degree of time and distance independence, a precise nuance of each term differs, reflecting the diversity of such offerings.

First of all, the spectrum of these terms ranges from a traditional classroom-based course, which uses the Internet/Web to supplement classroom activities. Such a course may use the Internet/Web to deliver class materials such as syllabi, homework assignments, lecture notes, exams, and Q&A sessions. At the other end of the spectrum is a degree-granting program offered completely through online activities without requiring students to physically attend any classes. All of the terms listed above fall in somewhere between the two ends of the spectrum.

Traditionally educational systems in most countries had required in-class instruction by teachers and in-class attendance by students. When distance learning programs started to appear in the early 20th century under the more commonly known name at that time, correspondence courses, their major purpose was to serve the population who could not afford to have higher education otherwise, such as geographically remote students. The primary communication mode between an instructor and students was regular mail.

In the early 1970s, as television became the common household media, some distance learning programs which started to utilize this telecommunications media. However, television is an expensive medium for production and distribution and in order to recoup such cost, those distance learning programs, which utilized television for instructional delivery, followed the model of mass education utilizing satellite

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broadcasting or cable television. In such a model, instructional delivery tended to be one-way (i.e., from an instructor to students) and interactivity between the instructor and students or among the students was limited.

In 1980s, the prevalence of VTR made it possible to utilize asynchronous mode of instructional delivery via television, which provided students with flexibility in time in addition to place. But, the model of instruction still tended to be unidirectional, leaving few opportunities for a student to interact with the instructor or other students.

Today's sophisticated interactive communications technologies allow distance educators and learners to go beyond this transmission model of instructional delivery, allowing a high degree of interactivity between a teacher and students and among students at a reasonable cost. The interactivity is defined in the educational context as "..a process whereby students are systematically encouraged to be active participants in their own learning. It is achieved by teaching approaches that engage students in the construction of knowledge."[Center for Interactive Learning, 94]. In the context of the use of information technology in education, there are two kinds of interactivity: interactivity between a student and the material as seen in computer-based training (CBT) and interactivity among people including instructors and students as seen in computer conferencing. The latter form of interactivity is the culmination of the new mode of teaching and learning. The benefits of having more interactions in effective learning have been discussed and attested in various educational communities. As culminated by the Kenneth Bruffee's writing on peer interaction in the classroom, constructivist theorists argue that people construct their knowledge through social interaction with others.

Based on this theory of social construction of knowledge, effective distance learning programs should facilitate social interaction among students and between instructor and students. With today's technologies such as the Internet and various computer network applications, it has become easier to implement interactivity into a distance learning program. Electronic mail facilitates personal interaction between an instructor and a student and computer conferencing facilitates class-wide interaction among students without being constrained by time and distance.

With the prevalence of today's Web technology, there is a danger that the old transmission model of one-way instructional delivery will be repeated, ignoring the importance of students' interaction and leaving students autonomous and isolated. An instructor can utilize the Web to place his/her course materials for students' retrieval, but still the Web may be a primitive media for creating an interactive learning environment. In that sense, the term, web-based instruction/courses/distance education, may not be the right term yet for this emerging model of distance education delivery.

Apart from the Web, there are a number of collaborative technologies or so-called groupware, which support various degrees of interactivity. Some of them are proprietary, but the current overall trend of such technological development is the more integration with the Web. Taking advantage of the wealth of information available on the Web, such a collaborative technology is becoming a great vehicle for effective instructional delivery. However, the mere use of a collaborative technology in distance education programs may not guarantee that it will facilitate learning. Its effective incorporation into a distance learning course requires careful design and the instructor's time and efforts. The role of an instructor in this model will be more of a facilitator of learning than a presenter of a fixed body of information.

In this study authors conducted an extensive survey of current distance education programs in a variety of universities with emphasis on those with some online/Internet/Web components built in, to develop a taxonomy of current distance learning systems and to identify important dimensions that need to be considered in designing a distance learning system. The long history of distance learning programs reflects a variety of modes of distance learning programs. Still a number of programs rely on the communications mediums of one-way presentation. On the other hand, the number of distance learning programs which take advantage of more interactive communication mediums, namely computer networks and the Web is increasing dramatically. This study examined such recent phenomena and categorizes those newly emerged distance learning programs in order to provide a clear picture of higher education in cyberspace. (The listing of institutions under the following categories and matrix of technologies used by each institution can be found at http://ritdl.rit.edu/Research/higher-education.htm.)

2. Taxonomy of Higher Education Institutions in Cyberspace

Buzzwords such as virtual university, virtual college, virtual campus, online campus, electronic university, and electronic campus are being used without putting much thought, and a variety of online degrees are being offered by unaccredited institutions (see "Is the Internet Becoming a Bonanza for Diploma Mills?" *Chronicle of Higher Education*, December 19, 1997). Though the idea of providing anytime/anywhere learning environment is notable and many reputable institutions offer such alternative learning programs with quality, for a prospective student such diversity of distance learning programs is rather confusing.

After closely examining more than 80 online distance learning programs, the author came up with six different categories: online course catalogs/clearing houses, university brokerages, virtual university consortia, virtual universities, online campuses, unaccredited online campuses.

2.1. Online Course Catalogs/Clearing Houses

Online course catalogs or clearing houses catalog online and distance education courses offered by universities and colleges and create searchable database to make such information readily available to public. They are solely information sources and they don't offer any courses or degrees themselves though some of them call themselves as "university", "academy", or "campus".

2.2. University Brokerages

University brokerages are those institutions which do not have any faculty members of their own and do not offer any courses but do award degrees to those students who have taken required number of credits from specified universities and colleges. This seems to be the emerging trend of distance learning programs as two such organizations, Regent College and Western Governors University, are newly formed and have been attracting a great deal of media attention. They are mainly comprised of universities and colleges in a specific region and aim to provide students with flexibility and mobility to take courses from different institutions in the region. This form of degree offering may become popular in future once policies and academic support systems have been worked out in a wider scale.

2.3. Virtual University Consortia

Virtual university consortia are similar to university brokerages in the sense that those are the associations of multiple universities/colleges. The difference between university brokerages and virtual university consortia is that the former offer degrees of their own while the latter do not. For example, SUNY Learning Network is a good example of virtual university consortia as it is an association of eight colleges, and students can take courses from any of the eight colleges. However, the degrees are awarded only by either one of two existing colleges: SUNY Empire State College or SUNY New Paltz.

2.4. Virtual Universities

Virtual universities are identical to universities and colleges in the traditional sense as they have their own faculty members, they offer courses to their students, they provide students services, and they award degrees. The only difference between traditional universities/colleges and virtual universities is that in virtual universities students don't have to commute to the campus and physically attend classes to earn a degree. There are universities of this type catering to masses as the distance learning format allows them to expand their markets regardless of their geographical location and reach as many students as possible. An example of this type of universities is University of Phoenix. The university is a for-profit organization and claims itself to be one of the nation's largest private accredited institutions for business and management.

There is the other type of virtual universities, which can be called "niche universities". The ability to reach millions of people beyond geographical limitations allows educational institutions of a special kind to exist. Examples are: The American College of Prehospital Medicine, California College for Health Sciences, and ISIM University. This kind of virtual universities are more likely to increase in the future as the competition among different universities/colleges become fiercer and universities/colleges struggle to find a way to survive.

In addition to such distinction in terms of audiences they serve, there are two types of virtual universities in terms of their course format. Many virtual universities that rooted in traditional correspondence schools do not have classes; in other words, they provide no support mechanisms for students to communicate or collaborate with fellow students to ask questions or to discuss issues. The students have to study on their own in somewhat isolated environments with a little guidance from an instructor or a tutor. Though those institutions can be also called "virtual universities", as they do not have physical campuses but have faculty members, offer courses, and award degrees, those institutions should be distinguished from the other kind of virtual universities; virtual institutions that emulate traditional universities in providing class-based learning environment. The former type has an advantage; it offers true asynchronous learning experience as it usually allows open entry (meaning a student can register and start a course any time he/she wants) and it allows self-paced learning. However, without the opportunities to interact with other students, the learning experience it can provide may be somewhat limited.

2.5. Online Campuses

Online campuses are online version of traditional universities/colleges campuses. It means that those institutions in this category are universities/colleges which exist in physical campuses and have been offering courses and degrees to on-campus students. As the recent popularity of the Internet, many of such universities and colleges have started to move some portion of the courses or some part of their degree programs online. There is a wide variety of such offering, ranging from universities and colleges which utilize the Web as supplement to on-campus course offering to those offer complete certificate, associate, bachelor's master's and doctor's degree programs online. In offering those degree programs online, inevitably the institutions have to create not only the courses online but also a learning environment for students to register for classes, pay tuition, order books, seek academic advising, and search for resources.

2.6. Unaccredited Online Campuses

As mentioned previously, there are unaccredited institutions that offer courses and degrees online. As long as those institutions are clear in their goals that they don't intend to offer degrees in a traditional sense but to offer training and workshops for career development, this type of online campuses become a good supplement to higher education. However, some institutions (most notoriously Columbia State University) are not clear about their accreditation and offer degrees that may not be recognized by other institutions and organizations. Due to the ease of setting up a virtual campus in comparison to a traditional physical campus, these kind of unaccredited online campuses may proliferate. Prospective students must be wary of such "diploma mills" and should thoroughly examine the mission of the institution before enrolling and paying their tuition.

3. Elements of Online Courses

Virtual universities and online campuses usually have a nice Web interface to some or all of the following components of a university or a college: course catalog, registration, academic calendar, library, financial aid, student advising, career counseling, bookstore, and user support.

At a micro level, the components of a virtual university and an online campus are individual courses. The use of the Web and computer networks in the courses has potential to be advantageous in four ways. First, the nature of its platform independence and easy sharing of data enable collaboration among distant peers. With the computer conferencing tools, students in disparate places and in disparate times can

attend virtual classrooms where thoughtful ideas and comments may be exchanged and heated discussions may be held. Second, the hypertext links allow integrating disparate sources of educational materials and disparate formats of information into one place. Connecting ideas and presenting information in different formats are easier and students will have easier access to the wealth of information. Third, the updating the information is easier on the Web and not like print-based or computer-based training materials, the information on the Web can be constantly updated and adjusted as the class progresses. Lastly, the Web, especially the next generation of HTML called XML (eXtensible Markup Language) will provide the potential to dynamically customize the content of the course materials according to the skill and knowledge level of the student. The courseware tailored to an individual learning style will make the learning experience more efficient and effective.

Each course consists of three parts: course material presentation/distribution, communication between an instructor and students or among students, and assessment of students' coursework. In distance learning, different technologies can be used for each course component.

3.1. Course Material Presentation/Distribution

The most common approach to online course is putting syllabus that will serve as the navigational tool for the content of the course. The course syllabus page usually contains the links to the lecture materials presented in the HTML format or PowerPoint format, and links to other resources. Many sites require a student to log in with his/her user ID and password so that the course materials are not available to those who have not registered for the course. Some colleges and universities provide a template for the course web page so that all the online courses in the institution have a consistent look, which may be less confusing to students.

The most technologically advanced course material presentation and distribution would be the Stanford Online project, which digitized and compressed the videos developed for Stanford Instructional Television Network (SITN) courses using VXtreme streaming video technology and then stored them on a video server, making those classes available to company-sponsored students as well as campus students in an on-demand, video-streaming environment Though it would be nice to utilize desktop videos for course material presentation and distribution, currently this is limited to a corporate environment or on-campus environment where students have access to high-speed lines directly. Another advanced course material presentation example can be found at USC ITV Distance Learning Online. It uses the RealVideo steaming video technology with the synchronized slide presentation in another frame of the web browser window.

3.2. Communication

Communication should occur between an instructor and students and among students. It can be one-to-one and can be one-to-many, and can be synchronous (i.e., real-time) or asynchronous. The authors strongly believe that one of the major advantages of online courses is the facilitation of interaction between an instructor and students and the high level of student involvement in their learning. As this component of online course is rather intangible compared with the presentation aspect of online courses, it is often overlooked or underestimated in implementation of online courses. The key to a successful online course is the creation of virtual microculture [Aoki, 95]. Virtual microculture is a unique group dynamics, which arises as a result of frequent interaction and collaboration toward a common goal.

There are a number of tools which are designed to facilitate interaction and collaboration in an online course [Aoki, 98]. But tools are just tools; tools themselves do not create a successful online learning experience for students, but instructors who utilize those tools to moderate, direct, and facilitate online discussions. Those tools enable more thoughtful discourse, as interaction is not bounded by time.

3.3 Assessment

There is always a suspicion among educators who are just starting to put their courses online, that in online courses an instructor cannot tell the person who is taking the exam or quiz is actually the person

who claims to be. In traditional distance learning programs proctored exams have been widely used as the method of assessment as in proctored exams the authentication is rather easily done by checking the student's picture I.D. Online quizzing seems to be gaining its popularity recently because of the availability of tools, which make the creation and administration of such quizzes relatively easy. However, only few courses actually utilize such online quizzing systems as a primary means of assessing a student. Instead, most online quizzing systems are used for students to self-test their learning.

The concept of competency-based assessment of learning has been implemented in some virtual universities, including Western Governor's University. The concept tried to assess an individual's skills and knowledge instead of clock hours spent in courses. The concept is noble as most learning may actually occur outside of formal educational settings. However, it is still uncertain to what extent such competency can be standardized and measured across a variety of disciplines in such a rapidly changing world. As the major focus of the Western Governor's University's mission is to develop such assessment tools, we will see how they develop the assessment tools.

4. Conclusion

As the Gutenberg's printing press made education more accessible to masses centuries ago, computers and the Internet has the potential of transforming public education into the learning opportunities for everyone at anytime in anyplace. We have started to see some of such a trend in higher education in a fairly subtle way, but still the transformation has not been realized to its full potential yet. As Jack Crawford mentioned in his article [Crawford, 95], "for the most part all we have really done is used the new technology to 'speed up' the old way of doing things rather than to reform it." This is an easy trap that many institutions may fall in as it is much easier to use technology to extend what they have been doing than fundamentally transforming the nature of institutions. The beauty of the global Internet is that it enables people to participate in professional dialogue regardless of their location, gender, social status, and national origin. Abundant resources, which were not accessible to public before, are now available on the Internet. In a way, microcomputers and the Internet can put more education into the hand of students; in other words, it can make education more student-centered. A student can now be more in charge of what, when, and where he/she learns. Along the line, higher education institutions will no longer be the center of power and control of dispensing information and knowledge, but service organizations that cater to students' needs for guidance and leadership. The higher education institutions that will thrive in the next century may not necessarily be the ones who have adopted the most advanced technologies, but the ones who have made the shift in the role of educational institutions to enable truly student-centered learning.

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